

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method performed by one or more server devices, the method comprising:

collecting, by one or more processors of the one or more server devices, information associated with a group of users visiting a web site that includes an advertising link, where the group of users visiting the web site includes a ~~first~~ set of non-malicious users and a different ~~second~~ set of malicious users;

identifying, by one or more processors of the one or more server devices, the set of non-malicious users visiting the web site from the group of users visiting the web site based at least in part on the collected information;

identifying, by one or more processors of the one or more server devices, a first proportion of a quantity ~~number~~ of non-malicious users visiting the web site to a total quantity ~~number~~ of users visiting the web site; [[and]]

determining, by one or more processors of the one or more server devices, an occurrence of spamming on the web site, where the determining includes:

identifying a second proportion of a quantity ~~number~~ of clicks on the advertising link by identified non-malicious users to a total quantity ~~number~~ of clicks on the advertising link by the group of users, and

comparing the identified first proportion to the identified second proportion;
and

taking a remedial measure when the occurrence of spamming on the website is

determined.

2. (Previously presented) The method of claim 1 where the collecting information includes:

tracking activities of the group of users visiting the web site.

3. (Currently amended) The method of claim 2 where the tracking activities includes:
determining whether the users in the group of users load images,
where identifying the set of non-malicious users includes identifying users, in the group of users, that are determined as loading images,

where the set of non-malicious users includes the users that are determined as loading images.

4. (Currently amended) The method of claim 2 where the tracking activities includes:
determining whether the users in the group of users have javascript turned on,
where identifying the set of non-malicious users includes identifying users, in the group of users, that are determined as having javascript turned on,

where the set of non-malicious users includes the users that are determined as having javascript turned on.

5. (Currently amended) The method of claim 2 where the tracking activities includes:
determining whether a ~~type of~~ browser is used by the users in the group of users,
where identifying the set of non-malicious users includes identifying users, in the

group of users, that are determined as using a browser,

where the set of non-malicious users includes the users that are determined as using a browser.

6. (Currently amended) The method of claim 2 where the tracking activities includes:
determining a number of times during an interval that at which each of the users in
the group of users visits the web site,

where identifying the set of malicious users includes identifying a first set of users, in
the group of users, that are determined to have visited the web site a number of times, during the
interval, that exceeds a threshold number of times,

where the set of non-malicious users includes a second set of users, in the group of
users, that is different from the identified first set of users.

7. (Currently amended) The method of claim 2 where the web site is associated with a
search engine, and

where the tracking activities includes:

determining a type of items for which searches are performed by the users in
the group of users,

where identifying the set of malicious users includes identifying a first set of users, in
the group of users, that are determined to have performed searches in an ordered manner,

where the set of non-malicious users includes a second set of users, in the group of
users, that is different from the first set of users.

8. (Previously presented) The method of claim 2 where the tracking activities includes:
tracking activities of users in the group of users visiting another web site.
9. (Previously presented) The method of claim 2 where each of the users in the group of
users is associated with a cookie identifier, and
where the tracking includes:
using the cookie identifiers to track the activities of the users in the group of
users.
10. (Previously presented) The method of claim 1 where each of the users in the group of
users is associated with a cookie identifier, and
where the identifying non-malicious users includes:
identifying non-malicious users based at least in part on an age of the cookie
identifiers associated with the users in the group of users.
11. (Previously presented) The method of claim 1 where each of the users in the group of
users is associated with a network address, and
where the identifying non-malicious users includes:
identifying the non-malicious users based at least in part on the network
addresses associated with the users in the group of users.
12. (Previously canceled)

13. (Previously canceled)

14. (Previously canceled)

15. (Currently amended) The method of claim 1 where the determining includes:

determining an occurrence of spamming of at least one advertisement on the web site,

and

where taking the remedial measure ~~the method further~~ comprises:

providing a refund in response to determining that the at least one advertisement has been spammed.

16. (Currently amended) A system comprising:

one or more server devices, comprising:

means for providing a web site₁ that includes at least one advertisement₁ to a plurality of visitors, where the plurality of visitors includes a plurality of malicious visitors and a plurality of non-malicious visitors,

means for identifying malicious visitors to the web site;

means for identifying non-malicious visitors to the web site;

means for determining a percentage of the non-malicious visitors out of the plurality of visitors to the website;

means for tracking at least one activity of the identified non-malicious visitors; [[and]]

means for determining an occurrence of click spamming on the web site based

at least in part on the tracked at least one activity of the identified non-malicious visitors, where the means for determining the occurrence of click spamming include:

means for comparing the percentage of non-malicious users selecting the at least one advertisement during the time period to the percentage of non-malicious users visiting the web site during the time period, and

means for determining that the at least one advertisement has been spammed when the percentage of non-malicious users selecting the at least one advertisement during the time period is significantly lower than the percentage of non-malicious users visiting the web site during the time period; and

means for taking a remedial measure when the occurrence of click spamming on the website is determined.

17. (Currently amended) A computer-readable memory device containing instructions for controlling at least one processor to perform a method for detecting click spamming of an advertisement on a server, the method comprising:

determining a quantity ~~number~~ of non-malicious users accessing the server;

determining an assumed percentage of the non-malicious users clicking the advertisement when the advertisement is provided to the non-malicious users;

receiving a plurality of clicks on the advertisement;

determining [[a]] an actual percentage, out of the plurality of clicks on the advertisement, of clicks on the advertisement by the non-malicious users clicking the advertisement when the advertisement is provided to the non-malicious users;

comparing the assumed percentage to the actual percentage; [[and]]

determining whether the advertisement has been click spammed based at least in part on the ~~determined percentage~~ comparing; and
taking a remedial measure when it is determined that the advertisement has been click spammed

18. (Previously presented) A server comprising:
a memory to store at least one advertisement; and
a processor to:
cause the at least one advertisement to be presented,
determine a number of non-malicious users accessing the server,
determine a percentage of the non-malicious users clicking the at least one advertisement, and
determine whether the at least one advertisement has been click spammed based at least in part on the determined percentage.

19. (Previously presented) A method performed by one or more server devices, the method comprising:
identifying, by one or more processors of the one or more server devices, a group of non-malicious users visiting a web site;
determining, by one or more processors of the one or more server devices, a click rate of an item associated with the web site for the group of non-malicious users; and
determining, by one or more processors of the one or more server devices, whether the item has been click spammed based at least in part on the determined click rate for the non-

malicious users.

20. (Previously presented) The method of claim 19 further comprising:
determining a total number of users visiting the web site, and
where the determining whether the item has been click spammed includes:
comparing the determined click rate for the non-malicious users to a click rate
for the total number of users visiting the web site, and
determining that the item has been click spammed when the click rate for the
total number of users exceeds the determined click rate for the non-malicious users.

21. (Previously presented) The method of claim 19 where the identifying includes:
tracking an activity of users visiting the web site, and
identifying the group of non-malicious users based at least in part on the tracked
activity.

22. (Previously presented) The method of claim 21 where the tracking includes
determining, for each user, at least one of whether the user loads images, an age of a cookie
associated with each user, whether the user has javascript turned on, a type of browser used by the
user, or an interval at which the user visits the web site.

23. (Original) The method of claim 19 further comprising:
taking remedial measures in response to determining that the item has been click
spammed.

24. (Previously presented) The method of claim 19 where the determining a click rate of the item for the group of non-malicious users includes:

estimating a percentage of non-malicious users visiting the web site, and

setting a percentage of clicks of the item from non-malicious users to approximately equal the estimated percentage.

25. (Previously presented) The method of claim 24 where the determining whether the item has been click spammed includes:

determining whether an actual click rate of the item for the group of non-malicious users differs from the set percentage of clicks of the item.

26. (Previously presented) The method of claim 19 where the determining a click rate of the item includes:

determining different click rates of the item for the group of non-malicious users, the different click rates corresponding to different time periods.

27. (Previously presented) The method of claim 26 where the different time periods include different times of a day or week.

28. (Previously presented) The method of claim 26 where the different time periods include different months of a year.

29. (Previously presented) A computer-readable memory device containing instructions for controlling at least one processor to perform a method for detecting a spamming of an advertisement displayed by a server, the method comprising:

identifying non-malicious visitors to the server, where identifying the non-malicious visitors includes identifying that the non-malicious visitors are not spam programs;

determining a click rate of the advertisement for the non-malicious visitors; and

determining whether the advertisement has been spammed based at least in part on the determined click rate for the non-malicious visitors.

30. (Previously presented) A server comprising:

a memory to store at least one item; and

a processor to:

cause the at least one item to be displayed,

identify a number of non-malicious users accessing the server,

compare the number of non-malicious users to a total number of users to obtain a percentage,

set a click rate of the at least one item based at least in part on the percentage,

and

determine whether the at least one item has been spammed based at least in part on the click rate.

31. (Currently amended) A method performed by one or more processors of one or more server devices, the method comprising:

tracking, by one or more processors of the one or more server devices, activities of users visiting a web site that includes one or more advertising links, the tracking including determining, for each user, at least one of:

- whether the user loads images,
- an age of a cookie associated with each user,
- whether the user has javascript turned on,
- a type of browser used by the user, or
- an interval at which the user visits the web site;

identifying, by one or more processors of the ~~processor~~ one or more server devices, non-malicious users from among the users visiting the web site based at least in part on the tracked activities;

determining, by one or more processors of the one or more server devices, whether the advertising link has been spammed, where the determining includes:

comparing an actual click rate of the advertising link by non-malicious users to an estimated click rate of the advertising link by non-malicious users, where the estimated click rate is based at least in part on historical data that includes data indicating a click rate of the advertising link by non-malicious users during a previous time period.

32. (Previously presented) The system of claim 16 where the means for identifying non-malicious visitors includes at least one of:

- means for determining whether visitors to the web site load images,
- means for determining whether the visitors to the web site have javascript turned on,
- means for determining a type of browser used by the visitors to the web site,

means for determining an interval at which the visitors to the web site visit the web site, or

means for determining a type of items for which searches are performed by the visitors to the web site.

33. (Previously canceled)

34. (Currently amended) The computer-readable memory device of claim 17 where the ~~determining whether the advertisement has been click spammed based at least in part on the determined percentage includes: comparing the determined~~ expected percentage of the non-malicious users clicking the advertisement is based at least in part on [[to]] a percentage of non-malicious users clicking the advertisement from a different time period.

35. (Currently amended) The computer-readable memory device of claim 17 where the determining whether the advertisement has been click spammed includes:

~~estimating a percentage of non-malicious users clicking the advertisement to be approximately a percentage of non-malicious users accessing the server, and~~

determining that the advertisement has been clicked spammed when the actual ~~determined~~ percentage of non-malicious users clicking the advertisement is lower than the estimated percentage of non-malicious users clicking the advertisement.

36. (Previously presented) The server of claim 18 where, when determining whether the at least one advertisement has been click spammed, the processor is to:

compare the determined percentage of the non-malicious users clicking the at least one advertisement to a percentage of non-malicious users clicking the at least one advertisement from a different time period.

37. (Previously presented) The server of claim 18 where, when determining whether the at least one advertisement has been click spammed, the processor is to:

estimate a percentage of non-malicious users clicking the at least one advertisement to be approximately a percentage of non-malicious users visiting the server, and

determining that the at least one advertisement has been clicked spammed when the determined percentage of non-malicious users clicking the at least one advertisement is lower than the estimated percentage of non-malicious users clicking the at least one advertisement.

38. (Previously presented) The computer-readable memory device of claim 29 where the method further comprises:

determining a total number of visitors to the server, and

where the determining whether the advertisement has been spammed includes:

comparing the determined click rate for the non-malicious visitors to a click rate for the total number of visitors to the web site, and

determining that the advertisement has been spammed when the click rate for the total number of visitors exceeds the determined click rate for the non-malicious visitors.

39. (Previously presented) The computer-readable memory device 29 where the identifying non-malicious visitors to the server includes:

tracking a factor associated with visitors to the server, the factor including at least one of whether the visitors load images, ages of cookies associated with the visitors, whether the visitors have javascript turned on, types of browsers used by the visitors, or intervals at which the visitors visit the server, and

using the tracked factor to identify the non-malicious visitors to the server.

40. (Previously presented) The server of claim 30 where, when identifying a number of non-malicious users accessing the server, the processor is to:

track a factor associated with users accessing the server, the factor including at least one of whether the users load images, ages of cookies associated with the users, whether the users have javascript turned on, types of browsers used by the users, or intervals at which the users access the server, and

use the factor to identify the number of non-malicious users accessing the server.

41. (Previously presented) The server of claim 30 where the at least one item includes an advertisement.

42. (Currently amended) The method of claim 31 further comprising:
determining a quantity of the identified non-malicious users that clicks the advertisement link; and

determining whether the advertisement has been spammed based at least in part on the determined quantity of the identified non-malicious users that clicks the advertisement.

43. (Currently amended) The method of claim 31 further comprising:
determining that spamming occurs on the web site based at least in part on a behavior of the non-malicious users visiting the web site.
44. (Currently amended) The method of claim 1 where the determining the occurrence of spamming on the web site further includes:
determining, based at least in part on the comparing, that the identified first proportion is greater than the identified second proportion.
45. (Currently amended) The method of claim 1 where the determining that the occurrence of spamming on the web site further includes:
determining, based at least in part on the comparing, that the identified first proportion is greater than the identified second proportion plus a predefined threshold.
46. (Previously presented) The system of claim 16 where the means for identifying malicious visitors comprise means for identifying spam programs.